

PROJECT TITLE : SALAMANDER-II
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SUMMARY OF PREVIOUS RESULTS

The previous experiments led to the following conclusions about smoke components reacting with cysteine under the conditions of the ISH measurements :

Components having no effect :

- Semi-volatile and tar components
- Organic gas-phase
- Inorganic components with boiling points down to - 120°C.
- free-radicals

Components having a possible effect :

- Very volatile inorganic gases
- NO
- CO

REACTIVITY OF PURE GASES NO, CO and O₂ WITH CYSTEINE

Procedure

The data for cigarette ØS-B-TOT, used as a standard, are :

NO : 0.31 mg/cig or 9.3 mg/30 cig
CO : 16.1 mg/cig or 483 mg/30 cig

A bag containing the same amounts of NO or CO, as in the smoke of 30 cigarettes ØS-B-TOT, is connected to the smoking machine. The volume is adjusted to 8400 ml (30 cig x 8 puffs x 35 ml) with nitrogen.

In this way the pure gases are introduced into the flask containing the cysteine solution at the same rate as for a normal smoking experiment. Experiments are made with NO alone, CO alone and a mixture of NO + CO.

In order to reproduce normal smoking conditions, a second bag containing oxygen is connected to the smoking machine. In this case the first bag contains 6700 ml of NO and/or CO in nitrogen and the second bag 1700 ml of oxygen (20% of 8400 ml).

A blank is made by using air alone.

The results are given in Table 1.

TABLE 1 : Effect of Pure Gases on Cysteine

Trial	ISH %
ØS-B-TOT	39 ± 2
air	0
NO + N ₂	0
CO + N ₂	0
NO + CO + N ₂	8 ± 2
NO + N ₂ + O ₂	20 ± 2
CO + N ₂ + O ₂	0
NO + CO + N ₂ + O ₂	18 ± 4

Conclusions

- Air (or oxygen), NO and CO alone have no effect on the ISH.
- Mixtures of NO/CO in N₂ and of CO in N₂/O₂ do not significantly react with cysteine.
- NO contributes about 50% of the ISH value, but only in the presence of oxygen.



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